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MANUFACTURING MANAGEMENT

From basic machining to quality product

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SEM Analysis of Coir Fiber and Coir Fiber-Albumen-Concrete Before and After Surface Treatments

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1. Introduction

Coir fiber is the seed-hair fiber obtained from the outer shell or husk of the coconut which are generally brown in color and available in lengths of 125-300mm.The cross section of the fibers is nearly circular with diameter ranging from 200-250 μm [1]. They are pale when immature but later become hardered and yellowed due to deposition of lignin on their walls [2]. Table 1 below shows the chemical composition of coir fiber.

Table 1: Chemical Composition of Coir Fiber. [3] (C.Asasutjarit et al., 2005)

Chemical Composition	Percentage Composition (%)
Ash content	2.8
Alcohol-benzene solubility	3.0
Lignin	32.1
Holocellulose	68.9
Alpha—cellulose	34.9
Hemi-cellulose	16.8

Coir fiber is abundantly available in many countries such as India, Philippines, Sri Lanka, Malaysia and Thailand [4]. It was selected to fabricate composites to substitute wood and other materials due to its biodegradable character [5, 6]. It is reported that it would be decomposed in 20–30 years in the nature, thus it can be claimed as an environmentally friendly material [4]. Lignin, pectin and other impurities within the coir fiber are considered harmful for its adhesion with the matrix during the composite fabrication Mechanical and electrical properties of coir fibre reinforced polypropylene composites were reported [7]. The coir fiber reinforced rubber materials have found wider application [8, 9].